Abstract 419

TITLE: Thermoreversible Gel Containing Sodium Lauryl Sulfate as a Potential Topical Microbicide for the Prevention of STDs/HIV

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BACKGROUND: Heterosexual transmission may account for 90% of HIV infection by the end of the decade. Condom use is presently the only readily available measure to successfully reduce the propagation of HIV, herpes and other pathogens causing sexually transmitted diseases (STDs), but unfortunately, its use is not generalized particularly in high-risk populations. Therefore, there is an urgent need to develop new vaginal microbicides where women could protect themselves against HIV. In that respect, we have evaluated the potential of sodium lauryl sulfate (SLS), a chaotropic anionic surfactant, for its potency as a microbicide against HIV and HSV.

METHODS: The ability of the gel to block the passage of HIV-1 and prevent infection of susceptible cells was evaluated by measuring virally-encoded luciferase activity. The efficacy of the gel to prevent HSV-2 infection of Vero cells has also been monitored by measuring plaque-forming units. The effect of SLS on the infectivity of different HSV-1 and HSV-2 strains was determined in Vero cells. The efficacy of SLS, incorporated into a thermoreversible gel formulation (the Invisible Condom™), to prevent the genital transmission of HSV-2 was also evaluated in mice. Mice were pretreated intravaginally with 15 µl of the gel formulation containing SLS and 5 minutes post-application, mice were infected with HSV-2 strain 333 (viral inoculum $1.2x10^5$ PFU/5µl). The efficacy of the gel formulation to prevent HSV-2 infection was monitored from signs of redness and swelling in the perineal region and from survival.

RESULTS: The gel formulation acts as an efficient physical barrier to block the passage of HSV-1 and HSV-2, preventing infection of target cells. Pretreatment of viruses with SLS decreased, in a concentration-dependent manner, their infectivity to susceptible cells. Mice infected intravaginally with HSV-2 demonstrated perineal oedema and redness and by 6 to 9 days post-infection; most of them died of encephalitis. In contrast, all mice pretreated with the gel containing 5% SLS survived the HSV-2 lethal intravaginal infection and did not show any sign of infection.

CONCLUSION: These data demonstrate that the thermoreversible gel formulation containing SLS could represent an innovative prevention measure to reduce the sexual transmission of HSV, HIV and possibly other pathogens causing STDs. The gel formulation acts by itself as a physical barrier whereas SLS would act as a chemical barrier by disrupting envelop or membrane of pathogens.

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